South Africa - Visualisation of sequence and demographic data to assist HIV surveillance in Northern KwaZulu-Natal: extending the TasP/iSense dashboard to include markers of HIV drug resistance mutations.

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Report generated on: June 3, 2019

Visit our data catalog at: https://data.africacentre.ac.za/index.php

Overview

Identification

ID NUMBER
AHRI.TasP.DataEveryWhere.Dashboard.2016.v1

Version

VERSION DESCRIPTION
V1.0.0

Overview

ABSTRACT
This proposal aims to extend an existing collaboration between AHRI and UCL. As part of the iSense project, teams from AHRI and UCL have successfully developed a dashboard that integrates information from mobile computers used for TasP field visits with data from the clinics to display spatial coverage of homestead visits, highlighting those that require follow-up visits to ensure linkage to care. The dashboard provides a broad snapshot of the state of the study, spatially aggregating geographical zones in order to preserve the privacy of trial participants.

The aim of this proposal is to extend this framework to visualise presence and prevalence of drug resistance mutations (DRMs) within the study area. A higher prevalence of DRMs than expected may be linked to several factors, e.g. poor drug adherence, and thus of value to clinicians and healthcare workers in terms of focusing efforts and resource allocation.

KIND OF DATA
The existing dashboard is built on pseudonymised demographic data grouped into geographic hexagons. Within the PANGEA project, we have independently assembled HIV genomes from patient clinical samples and identified DRMs for each sample. To map the DRMs to each geographical hexagon, we require a lookup table to link the TasP/PANGEA IDs to hexagons.

UNITS OF ANALYSIS
Each sample ID should be linked to a single hexagon where possible.

TOPICS

Topic	Vocabulary	URI
HIV-1; Incidence; Phylogeny; Epidemics; Population Surveillance; Rural Population; HIV Infections; Africa	Africa Health Research Institute	www.ahri.org

KEYWORDS
Mapping, visualisation, data linkage, drug resistance, DRM, HIV-1

Coverage

GEOGRAPHIC COVERAGE
South Africa

UNIVERSE
Clusters: the trial area consists of 150 local areas (neighbourhoods). These were aggregated into 34 clusters of between one and six contiguous neighbourhoods, each cluster comprising an average of 1 000 individuals >15 years of age. Clusters were designed to encompass social networks based on earlier studies. TasP phase 1 has been implemented in 10 geographic clusters (5 control and 5 intervention). Twelve additional clusters have been opened in June 2014.

Locations: corresponds to physical locations. There are two types of locations: homesteads and TasP clinics.

Homesteads: the population lives in scattered homesteads that are not concentrated into villages or compounds. All usable and occupied homesteads were eligible for trial participation.

Households: each homestead coul be composed of one or several households. An household remains always attached to the same homestead.

Eligible individuals : all 16 years or older and resident household members. Each individuals is attached to an household. In case of internal migration, an individual could move to another household.

TasP clinics: dedicated trial clinics implemented in each survey cluster.

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

Name	Affiliation
Frampton, Dan	Division of Infection and Immunity, UCL, London Division of Infection and Immunity, UCL, London UCL, London
McKendry, Rachel	London Center for Nanotechnology, UCL, London
Pillay, Deenan	Africa Health Research Institute

OTHER PRODUCER(S)

Name	Affiliation	Role
Africa Health Research Institute		

FUNDING

Name	Abbreviation	Role
South African Medical Research Council	SAMRC	Genotyping funding source
Engineering and Physical Sciences Research Council	EPSRC	Design and implementation of dashboard within the iSense project

OTHER ACKNOWLEDGEMENTS

Name	Affiliation	Role
Jaco Dreyer	Africa Health Research Institute	Linking sample and demographic data design
Ed Manley	UCL Centre for Advanced Spatial Analysis (CASA), London	Implementation of iSense dashboard design
Dave Concannon	UCL Centre for Advanced Spatial Analysis (CASA), London	Implementation of iSense dashboard

Metadata Production

METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Africa Health Research Institute	AHRI		

DDI DOCUMENT ID

DDI.AHRI.TasP.DataEveryWhere.Dashboard.2016.v1

Sampling

Sampling Procedure

HIV positive individuals within the TasP surveillance area of the Africa Health Research Insititute from 2012 to 2016.

Questionnaires

No content available

Data Collection

Data Collection Dates

Start	End	Cycle
2012-01-01	2016-12-04	N/A

Data Processing

Data Editing

Samples were sequenced at the Durban based laboratory of AHRI; genome assembly and downstream sequence analysis was performed at UCL.

Data Appraisal

No content available

File Description

Variable List

AHRI.TasP.DataEveryWhere.Hexagons.2016.v1

Content	
Cases	1021
Variable(s)	5
Structure	Type: Keys: ()
Version	
Producer	
Missing Data	

Variables

ID	Name	Label	Type	Format	Question
V87	Id	Id	contin	numeric	
V88	Uid	Uid	discrete	character	
V89	Perimeter	Perimeter	discrete	character	
V90	Centroid	Centroid	discrete	character	
V91	t	t	discrete	character	

AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Content	
Cases	1750
Variable(s)	6
Structure	Type: Keys: ()
Version	
Producer	
Missing Data	

Variables

ID	Name	Label	Type	Format	Question
V92	PangeaId	PANGEA Unique Sample Identifier	discrete	character	
V93	Cohort	Cohort	discrete	character	
V94	SampleId	Unique Sample Identifier	discrete	character	
V95	SequenceLabId	Unique Sequence Identifier in the Lab	discrete	character	
V96	IndividualId	Unique Individual Identifier	contin	numeric	
V97	HexagonId	Unique Hexagon Identifier	contin	numeric	

hic data to assist HIV surveillance in Northern KwaZulu-Natal: extending the TasP/iSense dashboard to include markers of HIV drug resistance mutations.

Id (Id)

File: AHRI.TasP.DataEveryWhere.Hexagons.2016.v1

Overview

Type: Continuous
Format: numeric
Width: 12
Decimals: 0
Range: 1-1021

Valid cases: 1021
Invalid: 0
Minimum: 1
Maximum: 1021
Mean: 511
Standard deviation: 294.9

Uid (Uid)

File: AHRI.TasP.DataEveryWhere.Hexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 36

Valid cases: 1021
Invalid: 0

Perimeter (Perimeter)

File: AHRI.TasP.DataEveryWhere.Hexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 244

Valid cases: 1021

Centroid (Centroid)

File: AHRI.TasP.DataEveryWhere.Hexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 244

Valid cases: 1021

t (t)

File: AHRI.TasP.DataEveryWhere.Hexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 244

Valid cases: 1021

PANGEA Unique Sample Identifier (PangeaId)

File: AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 244

Valid cases: 1750

Cohort (Cohort)

File: AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 244

Valid cases: 1750

Unique Sample Identifier (SampleId)

File: AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 244

Valid cases: 1750

Unique Sequence Identifier in the Lab (SequenceLabId)

File: AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Overview

Type: Discrete
Format: character
Width: 244

Valid cases: 1750

Unique Individual Identifier (IndividualId)

File: AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Overview

Type: Continuous
Format: numeric
Width: 12
Decimals: 0
Range: 9-100102

Valid cases: 1750
Invalid: 0
Minimum: 9
Maximum: 100102
Mean: 12724.3
Standard deviation: 8856.5

Unique Hexagon Identifier (HexagonId)

File: AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Overview

Unique Hexagon Identifier (HexagonId)

File: AHRI.TasP.DataEveryWhere.SequnceMappedToHexagons.2016.v1

Type: Continuous
Format: numeric
Width: 12
Decimals: 0
Range: 412-1013

Valid cases: 1749
Invalid: 1
Minimum: 412
Maximum: 1013
Mean: 850.5
Standard deviation: 104.4

Documentation

Technical documents

Documentation:TasP.DataEveryWhere.Dashboard

Title	Documentation:TasP.DataEveryWhere.Dashboard
Author(s)	Sweetness H Dube
Date	27/05/2019
Country	South Africa
Language	English
Filename	DataDocument_DanFrampton_iSense_DRM_hexes.pdf

DDI:TasP DataEveryWhere Dashboard

Title	DDI:TasP DataEveryWhere Dashboard
Author(s)	Sweetness H Dube
Date	03/06/2019
Country	South Africa
Language	English
Filename	AHRI.TasP.DataEveryWhere.Dashboard.2016.v1.pdf